

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

---

1. (original) A system for optically imaging, the system comprising:
- (a) an array of cells for producing an electrical charge in response to photon stimulation;
  - (b) a charge shift register configured to receive the electrical charge produced by each cell in the array and to sequentially output the electrical charge of each cell;
  - (c) at least two charge sensing nodes for accumulating charge readable as a voltage; and,
  - (d) a charge demultiplexor configured to receive the output of the charge shift register and to selectively distribute the output to each of the at least two charge sensing nodes.
2. (original) The system of claim 1 wherein the array of cells includes a charge coupled device array.
3. (original) The system of claim 1 further including at least one output buffer configured to receive the voltage of each of the at least two charge sensing nodes.
4. (original) The system of claim 1 further including at least one amplifier configured to amplify the voltage from the at least two charge sensing nodes.
5. (original) The system of claim 1 further including at least one analog to digital converter configured to convert the voltage from the at least two charge sensing nodes into a digital signal.

6. (original) A method for producing a voltage signal segmented to represent an output of an array of cells that produce a cell electrical charge in response to photon stimulation, the method comprising:

- (a) receiving each of the cell electrical charges from the cells in a charge shift register;
- (b) sequentially outputting the cell electrical charges from the charge shift register to a charge demultiplexor;
- (c) the charge demultiplexor selectively distributing the sequential cell charges to one of at least two charge sensing nodes; and,
- (d) sequentially reading a voltage produced by the cell charges in at least one of the at least two charge sensing nodes.

7. (original) The method of claim 6 wherein the charge demultiplexor selectively distributing the sequential cell charges to one of at least two charge sensing nodes includes the charge demultiplexor distributing one cell charge to each of the at least two charge sensing nodes.

8. (original) The method of claim 6 wherein the charge demultiplexor selectively distributing the sequential cell charges to one of at least two charge sensing nodes includes the charge demultiplexor distributing multiple cell charges to each of the at least two charge sensing nodes.

9. (original) A system for producing a voltage signal segmented to represent an output of an array of cells that produce an electrical charge in response to photon stimulation, the system comprising:

- (a) a charge shift register configured to sequentially receive the charge from each cell;
- (b) at least two charge sensing nodes configured to accumulate charge and output a voltage signal;

(c) a charge demultiplexor configured to sequentially distribute each charge from the charge shift register to one of the at least two charge sensing nodes.

10. (original) The system of claim 9 further including at least one output buffer configured to receive the voltage of each of the at least two charge sensing nodes.

11. (original) The system of claim 9 further including at least one amplifier configured to receive and amplify the voltage of each of the at least two charge sensing nodes.

12. (original) The system of claim 9 further including an analog to digital converter configured to convert the voltage from the at least two charge sensing nodes into a digital signal.

AI  
cancel  
13. (new) The system of claim 1 further wherein at least one of the charge sensing nodes is configured to sum the electrical charge of at least two of the cells.

14. (new) The method of claim 6 further including summing at least two of the distributed cell charges on at least one of the charge sensing nodes before sequentially reading the voltage produced by the cell charges.

15. (new) The system of claim 9 further wherein at least one of the charge sensing nodes is configured to sum the electrical charge of at least two of the cells.

---